BKCASE

Body of Knowledge and Curriculum to Advance Systems Engineering

Inaugural Workshop on

The Systems Engineering Body of Knowledge and the Graduate Reference Curriculum on Systems Engineering

December 8th and 9th, 2009

Naval Postgraduate School

Monterey, CA, USA

WORKSHOP REPORT

Contents

1. BKCASE Project

BKCASE is the acronym for the Body of Knowledge and Curriculum to Advance Systems Engineering. The BKCASE project is led by the Stevens Institute of Technology and the Naval Postgraduate School. The project scope is to define a Systems Engineering Body of Knowledge (SEBoK) and to use the SEBoK to develop an advanced Graduate Reference Curriculum for Systems Engineering (GRCSE).

The planned outcome is that the SEBoK will be supported worldwide by the Systems Engineering community as the authoritative SEBoK for the SE discipline; and that the GRCSE will receive the same global recognition and serve as the authoritative guidance for graduate degree programs in SE.

A distinguished group of systems engineers from across the world is volunteering as authors and reviewers on the project, to collaborate over a three year period, and to deliver the products, the SEBoK and GRCSE, to the public inincrementally through 2012.

Information about the project is available at http://www.bkcase.org. Information can be accessed by perusing the various sections of the site. Over time the project authors hope to expand support for BKCASE from systems engineering practitioners, educators, and current and potential graduate students around the world. The BKCASE team encourages and welcomes the SE engineering community to provide feedback about all project efforts at bkcase@stevens.edu.

2. BKCASE Workshop 1

The inaugural workshop was held at the Naval Postgraduate School in Monterey, CA, USA on December 8th and 9th, 2009. A list of the workshop attendees is available in Appendix A and the meeting agenda in Appendix B of the report. The workshop's slide set is available online for download at the BKCASE website located at http://www.bkcase.org.

The objectives of the workshop were:

1. Teambuilding: the participants will be asked to commit to the project and select their own roles as authors

2. Project Scoping: the participants in attendance will agree with the scope of the project

3. Initial BKCASE Architecture: initial architectures will be developed for both SEBoK and GRCSE

4. Objectives between Workshops 1 & 2: tasks will be developed and assigned for participants to complete before our next meeting

5. Core Team Financial Commitments: Supplemental travel from the core team will be outlined for qualifying participants.

6. Concept of Operations (CONOPS): the framework of operations will be proposed and agreed upon.

The SE BoK served as an appropriate starting point for the inaugural workshop's overarching approach – to work on a SEBoK in parallel with the design of the advanced curriculum structure. The participants in attendance agreed to a general management structure, schedule, and process for the BKCASE project,

with much of the meeting focused specifically on SEBoK. The authors in attendance broke into teams, selected team leaders, and agreed to assignments each team will complete in preparation for the next workshop scheduled for April 2010.

3. *Workshop Proceedings*

3.1 Introductions

The workshop commenced with BKCASE Project Leader Art Pyster providing an overview of the background of the Integrated Systems and Software Engineering Curriculum (iSSEc) program, of which BKCASE is the second phase. The introduction of iSSEc material was followed by a review of the meeting's agenda and attendee introductions.   Please see Appendix B for the workshop's meeting agenda.   The workshop's slide set is available for download at the BKCASE website located at http://www.bkcase.org. Art Pyster reviewed drafts of the major discussion topics of the workshop, including: the BKCASE vision and value proposition; trends in systems engineering (SE); current major reference sources; differentiation and touchpoints between SEBoK and GRCSE; the initial BKCASE strategy; primary technical and project management decisions; an initial structure and approach for BKCASE version 0.25; and BKCASE meeting and workshop opportunities (both independent and associated with major international conferences).

Using these initial drafts created, the group discussed each of these topics and crafted specific language on the initial approach.

3.2 Project Context

BKCASE is the second phase or project of the iSSEc program. Version 1.0 of the first phase, curriculum guidelines for software engineering master's education (called Graduate Software Engineering 2009 (GSwE2009), formerly GSwERC), was completed in September 2009 with companion documents completed in November 2009. GSwE2009 is a document providing recommendations for software engineering master's curricula, with an "appropriate" amount of systems engineering integrated. The IEEE Computer Society (IEEE CS) and the ACM (ACM) will become stewards of the curriculum (in November 2009, the IEEE CS Board of Governors voted to sponsor GSwE2009 and the ACM Education Board voted similarly in December 2009), providing maintenance and upkeep. The Curriculum Author Team (CAT) of the GSwE2009 project will provide updates of the companion materials on a semi-annual to annual basis depending on availability of materials.

BKCASE will follow a similar volunteer-based structure for the creation of the SEBoK and GRCSE. BKCASE will focus on systems engineering, but with appropriate software engineering material integrated. Likewise, a goal to have professional society endorsements and sponsorship is shared, with professional societies eventually taking over stewardship of the document (post version 1.0).

Once BKCASE is completed, the third project or phase of the iSSEc program will be a fully integrated software and systems engineering curriculum.

3.3 BKCASE Authors

Art Pyster reviewed the current list of BKCASE authors provided in Appendix C. He noted that the current group is very talented. There is a push to add another 10-15 authors to the team over the next couple of months. He also indicated that it would be best for BKCASE if we can recruit authors who will help broaden the expertise of the current author team in other application domains or countries.

During the meeting, several individuals offered to reach out to their contacts. Most of the potential authors discussed would add experience in new domains or would add perspective from a participating or additional country.

Action Items
• John Baras will work to recruit authors in the telecommunications, medical, civil engineering infrastructure (water management and environmental engineers), and civil aviation areas
• Kevin Forsberg will contact individuals in highways and dams (public works) in the Netherlands; and Erik Aslaksen, with domain experience in construction from Australia; Mike Krueger on transportation system from California DOT
• Nicole Hutchison will invite Guilherme Travassos, who supports a combined SE/SW program from Brazil and may represent the Brazilian Computer Society and Bobby Milstein from the U.S. Centers for Disease Control and Prevention (CDC)
• Rick Adcock will contact Tom Strandberg from mobile communications Sweden
• Tim Ferris will reach out to Yoshi to get recommendations for authors from the commercial sector in Japan; he will also reach out to the manufacturing sector in Taiwan and China
• John Snoderly will reach out for automobile and ship-building authors from South Korea
• Garry Roedler will reach out to Johann Anselma in South Africa (non-defense domain)
• Art Pyster will reach out to IBM Global Systems on non-defense, large-scale systems
• Mary VanLeer will reach out to someone in c=Cloud Computing (possibly Amazon)
• Jean-Claude Roussel volunteered post workshop via email to contact colleagues in France and Germany as EADS colleagues or respecitvie members of AFIS (French INCOSE Chapter) and GfSE (German INCOSE chapter. Jean Claude is meeting with the AFIS team to introduce BKCASE. Alain Faisandier, AFIS Technical Director (also an ISO 15288 author well known in INCOSE community) is another recommended selection, by Jean Claude, for author.
• Alex Lee will reach out to others in commercial practice in Singapore
• **All authors should consider additional possible authors and contact Dr. Pyster and Dr. Olwell with further recommendations**

At the end of day two the author's divided into their assigned teams to work on schedules and ideas for drafting materials due for Workshop 2 (see section 5.4 for further elaboration).

4 Charter Content Part I

4.1 Vision

The vision statement was reviewed and agreed to. The BKCASE vision is:

> Systems Engineering competency models, certification programs, textbooks, graduate programs, and related workforce development initiatives around the world align with BKCASE.

4.2 SEBOK Value Proposition

Art Pyster provided a draft value proposition for the SEBoK portion of BKCASE. The team reviewed and revised the text. Based on these discussions, Rick Adcock created a revised draft, which was then reviewed, further refined, and accepted by the group with no objections. The current value proposition is:

1. There is no authoritative source that defines and organizes the knowledge of the SE discipline, including its methods, processes, practices, and tools. The resulting knowledge gap creates unnecessary inconsistency and confusion in understanding the role of SE in projects and programs; and in defining SE products and processes. SEBoK will fill that gap, becoming the "go to" SE reference.

2. The process of creating the SEBoK will help to build community consensus on the boundaries and context of SE thinking and to use this to help understand and improve the ability of management, science and engineering disciplines to work together.

3. Having a common way to refer to SE knowledge will facilitate communication among systems engineers and provide a baseline for competency models, certification programs, educational programs, and other workforce development initiatives around the world. Having common ways to identify metadata about SE knowledge will facilitate search and other automated actions on SE knowledge.

4.3 SEBOK Scale

The author team agreed that in order to be successful the project should cover a broad scale of systems. Specifically, scale was defined in both geographic and scoping terms. The SEBoK should provide information that is relevant to building a system of any scope or size. This includes small-scale projects (such as individual component design) up to major enterprise systems. In addition, the SEBoK should include issues that enable the support of local, national, and global-scale systems.

4.4 GRCSE Value Proposition

Between Workshops 1 and 2, the authors are going to focus their main attention on the development of draft materials for Version 0.25 of the SEBoK. However, to fully understand the context of the SEBoK work, the authors also reviewed the value proposition for GRCSE. Art Pyster provided a draft, which was generally agreed to by the authors as an appropriate initial draft:

1. There is no authoritative source to guide universities in establishing the outcomes graduating students should achieve with a master's degree in SE, nor a guidance source on reasonable entrance expectations, curriculum architecture, or curriculum content.

2. This gap in guidance creates unnecessary inconsistency in student proficiency at graduation, makes it harder for students to select where to attend, and makes it harder for employers to evaluate prospective new graduates.

3. GRCSE will fill that gap, becoming the "go to" reference to develop, modify, and evaluate graduate programs in SE.

5 Charter Content Part I

5.1 Initial BKCASE Strategy

Art Pyster provided a draft list of strategic points for the development of BKCASE. The authors reviewed the list and revised several points and added others. After the discussion the author team agreed to the following as the initial strategic approach of BKCASE.

1. Publish incrementally/iteratively with GRCSE trailing SEBoK

2. Create common vocabulary to facilitate communications among the team

3. Throughout the project, involve professional societies to facilitate quality, acceptance, and their eventual role as stewards

4. Build early consensus and maintain it throughout the lifetime of the project

5. Rely on and include academia, industry, and government from multiple fields for authors and reviewers

6. Extensively leverage volunteer labor for both authoring and review

7. Rely on existing source material wherever possible and involve principals from efforts that created source material wherever possible

8. Leverage the processes used to create GSwE2009[1] and the NPS Modeling and Simulation Acquisition Curriculum

9. Keep completely open and collaborative at a global level – but authors make content decisions

10. Hold physical workshops every three months to synchronize teams and build team relationships – rely on virtual meetings, email, and other collaboration technology at other times

11. Keep the team focused on the value propositions when conflicts arise.

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1 Pyster, A., et al., *Graduate Software Engineering 2009 (GSwE2009): Curriculum Guidelines for Graduate Degree Programs in Software Engineering*, September 2009.

5.2 SEBOK Primary Technical Decisions

One of the objectives of the workshop was to review the objectives of SEBoK and determine what the primary technical objectives should be. Considerations included the overall vision for Version 1.0 and the roadmap for achieving this vision in all draft material development.

The final agreed-to primary technical decisions are provided in Appendix D. The authors stated these decisions would be reviewed at the second workshop to determine if they should change following the completion of initial work.

5.3 SEBOK Project Management Decisions

Art Pyster provided a list of questions to be answered by the authors at the workshop with regard to the substance and structure of the SEBoK because the SEBoK was the workshop's primary focus. However, many of the same questions will need to be answered for GRCSE at subsequent workshops.

The questions presented for discussion were:

1. What is the scope of SE to be included in the SEBoK?

2. How much is the SEBoK a guide to knowledge located elsewhere and how much knowledge is included within it?

3. How will domain-specific knowledge be handled?

4. What is the architecture of the SEBoK; e.g., is a classic tree-structured hierarchy an adequate way to structure SE knowledge?

5. How should the evolving nature of the discipline be accommodated?

6. Where there are multiple definitions, techniques, models, etc. for a single concept (such as *architecture*), how do we select which one(s) to include?

7. How will software engineering and project/program management and human/system integration be integrated into the SEBoK?

8. How do we expect the SEBoK to be used by the community?

9. How shall we deal with case studies?

10. How do we deal with the scale of different systems (enterprise, global, ….)?

11. What are the final products of the project?

The initial scope for SEBoK is to begin with the ISO/IEC/IEEE 15288[2] standard as a structure and evolve the structure until the SEBoK is complete. Because many systems engineers are familiar with the 15288 standard, it should work as a starting point. The general belief of attending authors is that the community will not have difficulty understanding the use of 15288 as a foundational document for developing SEBoK.

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[2] International Organization for Standardization. *ISO 15288:2008, Systems and Software Engineering – System Life Cycle Processes*, March 2008.

The authors will approach the SEBoK as primarily a guide to the SE body of knowledge, not as the body of knowledge itself. In other words, knowledge areas will include descriptions, but the SEBoK will not include all information available about a single topic. Instead, the authors will select a set of primary references that an individual could use to understand any SE area. The SEBoK will contain hyperlinks or other means to easily find the references, but the SEBoK itself will not contain most of these references.

For Version 0.25, the SEBoK will be domain independent. There will be no effort to define knowledge areas in terms or methods that are specific to a particular domain such as finance, medical devices, or defense systems. Domain specific knowledge will be discussed in companion case studies, which will select a few domains and walk through how their methods, processes, and terminology align with SEBoK. This decision will be revisited after the release and review of Version 0.25.

To keep the SEBoK current, the author team finds it important to allow users an opportunity to provide feedback that will be used to update future versions. The additional resources and information recommendations will be welcomed and may become important to systems engineers in a particular area.

Each SE term within the SEBoK will contain an official definition. The authors will use IEEE SEVOCAB[3] as a starting point for all terms. If a suitable definition is not found in SEVOCAB, then the authors will use the available definitions to craft a new definition. Once the new definitions are drafted, they will be discussed and edited by the group at large until a consensus is reached on the definition(s) to be included.

In order to determine the expected uses, the author team spent several hours defining potential use cases for the SEBoK. From this, they determined a list of both primary and secondary users (discussed in items 3 and 4 of Appendix D). In essence, the authors recognized that the SEBoK could be useful to anyone interested in learning about SE. However, "everyone" is not a useful target for the development of the SEBoK. Instead, the authors will target information to the primary users identified in Appendix D, with an understanding that this information will be publicly available and, therefore, others may also use the information.

The structure of the SEBoK is intended to become an online dynamic structure, which will support the goal of allowing user feedback and suggestions. There was discussion of how this structure may be used by different user groups. The thought was that the structure would support different "views" which would be tailored to different stakeholders (e.g. there would be a different "view" for a practicing systems engineer than for project manager who simply wishes to understand more about SE).

5.4 SEBOK Project Management Decisions

Art Pyster provided a list of questions to be answered by the authors at the workshop with regard to the management of the project. The current effort is SEBoK, therefore the SEBoK served as the focal point

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[3] A project of the IEEE Computer Society and ISO/IEC JTC 1/SC7, more information can be found at http://pascal.computer.org/sev_display/index.action.

or all management questions introduced during Workshop 1 with the understanding that many of the same questions will need to be answered for GRCSE at subsequent workshops.

The questions presented for discussion were:

1. How will the author team be divided into groups and new authors added to groups?

2. How will decisions be made and recorded?

3. How will we conduct internal reviews?

4. How will we conduct external reviews?

5. How do we ensure consistency and integrate group efforts?

6. What collaboration environment is required for the authors to work?

7. What are the key milestones for the project?

8. How much work is actually required to deliver the SEBoK?

9. What will we consider success to be?

10. How do we interact with external organizations?

For initial work, the authors agreed to divide into groups to tackle the various process areas of 15288. While at the workshop, the authors divided the 25 processes of 15288 into 5 major categories. Then authors volunteered to support particular groups. The table below provides an overview of the teams and their responsibilities for Version 0.25. Note that individuals listed in bold are the leads for each team.

Team	Members	ISO/IEC/IEEE 15288 Processes
Blue	**Dave Olwell**, Brian Wells, Tom Hilburn	Acquisition, Supply, Configuration Management, and Information Management processes
Red	**Kevin Forsberg**, Mary VanLeer, Rick Adcock	Life Cycle Model Management, Infrastructure Management, Project Portfolio Management, Human Resource Management, and Quality Management processes
Green	**Ray Madachy**, Ken Nidiffer, Barry Boehm, Garry Roedler	Project Planning, Project Assessment and Control, Decision Management, Risk Management, and Measurement processes
Yellow	**John Snoderly**, John Baras, Alice Squires, Don Gelosh, Bud Lawson, Jean Claude Roussel	Stakeholder Requirements Definition, Requirements Analysis, Architectural Design, and Implementation processes
Purple	**Massood Towhidnejad**, Tim Ferris, Alex Lee	Integration, Verification, Transition, Validation, Operation, Maintenance, and Disposal processes
Gold	**Art Pyster**, Dave Olwell, Rick Adcock, Bud Lawson, Barry	Introduction to SEBoK and SE with use information (Gold team is responsible for drafting the introductory

	Boehm, Alice Squires, Massood Towhidnejad	materials for Version 0.25)

It is understood that these teams, while useful for getting to version 0.25, will likely change as the task is better understood and the approach refined.

In general, decisions will be made as a whole by consensus.

Internal reviews will occur by providing the authors with reading materials prior to the workshops. Authors will then provide their feedback on materials to the appropriate leads for each section. The leads, in turn, will review and adjudicate the comments with their teams and provide a review of the comments and of the adjudication at the following workshop.

External reviews will follow a similar process, in terms of collection, analysis, and adjudication of comments. The formal process has not been defined, but it will likely be more structured than the current "free text" comments expected for internal reviews. The authors will select the first round of reviewers (for Version 0.25).

To aid product consistency and integration, a draft template for materials was created by Alice Squires, presented to the group, and refined at the workshop. This template will be sent to all authors and should be used for the creation of draft materials for the next workshop.

Primarily, collaboration will occur on the Sakai site. Teams will have both team-only access areas as well as the ability to post materials to the full group. Team-only access areas will be used for creating and storing multiple drafts. Review materials will all be posted to the full group for comment.

In terms of project success, the authors developed a list of success criteria. The consideration is that all criteria should be met in order for the project to be considered a complete success. These success criteria can be found in Appendix E.

The BKCASE project is meant to be globally significant. The authors will maintain global visibility by: maintaining constant interaction with primary professional societies (INCOSE, IEEE Systems Council, NDIA SE Division, etc); seeking reviewers from as many countries, domains, and levels of expertise as possible; publishing many articles and news items and holding workshops and panels at conferences to raise awareness of SEBoK; and identifying key advocates or champions for SE and asking them to champion the SEBoK. Outreach opportunities were identified by the authors and can be found in the workshop slide set from day 2 of the workshop.

5.5 Additional Workshops and Special Sessions

After the authors made initial technical decisions and agreed to the initial strategy for SEBoK development, they began developing the meeting schedule for additional workshops. When possible, the authors will hold workshops in conjunction with major international conferences to minimize impact on those who will generally travel long distances. Also, the workshop locations will vary to encourage global participation (currently, workshops will periodically shift between North America, Europe, and the Pacific; this rotation may change as additional authors are added).

The current schedule is listed here with the primary special session and/or workshop planner identified:

1. Special session at the INCOSE International Workshop (IW), February 6-9, 2010 in Phoenix, AZ – Art Pyster

2. Workshop 2, March 30-31, 2010 in Orlando, FL – Tom Hilburn

3. Special session at EUSEC on in Stockholm, Sweden, Sunday, May 23, 2010 and a BKCASE panel on May 26, 2010 – Rick Adcock

4. Workshop 3 on July 8-9, 2010 or July 9 and 11, 2010 at the INCOSE International Symposium (IS) in Chicago – Art Pyster

5. Workshop 4 on October 13-14, 2010 in Toulouse, France hosted by EADS or AFIS – Jean Claude Roussel

For the events related to other conferences, the individual listed is responsible for coordinating with the conference to determine a schedule and location and providing that information to the authors.

6 Way Ahead

Workshop 2 will focus on the review of the draft materials for SEBoK 0.25. At workshop 2, teams will provide drafts of their materials (2-3 pages for each process), no later than March 9, 2010, for review. The entire author team is expected to review these drafts and provide comments by March 18, 2010. The team leads will oversee the adjudication of comments by the individual teams and report on these comments at the workshop. Furthermore, the second workshop will begin answering technical and project management questions for GRCSE. In the interim, authors already attending the INCOSE IW will meet in a special session (time and date TBD) to review progress.

All action items for Workshop 2 are listed in Appendix F.

Appendix A: Meeting Participants

In Attendance

Rick Adcock, *INCOSE* (UK)

John Baras, *University of Maryland* (USA)

Barry Boehm, *University of Southern California* (USA)

Tim Ferris, *INCOSE/University of South Australia* (Australia)

Kevin Forsberg, *INCOSE* (USA)

Stephanie Few, *Naval Postgraduate School* (Support Staff) (USA)

Don Gelosh, *Office of the Director of Defense Research & Engineering* (USA)

Tom Hilburn, *Embry Riddle Aeronautical University* (USA)

Nicole Hutchison, *Stevens Institute of Technology* (Support Staff) (USA)

Bud Lawson, Lawson Konsult AB (Sweden)

Alex Lee, *Singapore Ministry of Defense* (Singapore)

Ray Madachy, *Naval Postgraduate School* (USA)

Ken Nidiffer, *National Defense Industrial Association* (NDIA) (USA)

David Olwell, *Naval Postgraduate School* (USA)

Art Pyster, *Stevens Institute of Technology* (USA)

Jean-Claude Roussel, European Aeronautical Defence and Space Company (France)

Gary Roedler, *Lockheed Martin* (USA)

John Snoderly, *Defense Acquisition University* (DAU) (USA)

Alice Squires, *Stevens Institute of Technology* (USA)

Mary VanLeer, *Arkansas Education Lottery* (USA)

Brian Wells, *Raytheon* (USA)

Appendix B: Meeting Agenda

Tuesday, December 8, 2010

0800   Introductions and Admin

0900-1145   Overview and Project scoping

1145-1230   Working lunch, Peacock Room

1300-1700   Concepts and Initial Architectures: BKCASE and GRACIE

Wednesday, December 9, 2010

0800   Objectives until next meeting and assignment of task

1100   CONOPS

1145-1230   Working lunch

1230 – 1500   Way Ahead

1500   Conclude

Appendix C: BKCASE Author Team

 The BKCASE participating author list is made up of 24 engineers. This list is expected grow to a total of 30-40 authors during 2010.

1. Rick Adcock
2. John Baras
3. Barry Boehm
4. Tim Ferris
5. Kevin Forsberg
6. Richard Freeman
7. Sandy Friedenthal
8. Tom Hilburn
9. Scott Jackson
10. Bud Lawson
11. Alex Lee
12. Ray Madachy
13. Ken Nidiffer
14. Dave Olwell
15. Art Pyster
16. Garry Roedler
17. Bill Rouse
18. Jean-Claude Roussel
19. Hillary Sillitto
20. John Snoderly
21. Alice Squires
22. Massood Towhidnejad
23. Mary VanLeer
24. Brian Wells

Appendix D: Primary Technical Decisions

The following are the initial primary technical decisions agreed upon by the authors in attendance:

1. The SEBoK organizes domain independent SE knowledge. It provides a structure for that knowledge, defines important terms, summarizes important topics, selectively helps users choose among popular alternative methods, facilitates search, printing, and application by its intended users, and identifies references which elaborate more fully on all topics. For Version 0.25, the SEBoK will include a set of primary references based on the expert opinion of the SEBoK authors. For subsequent versions, secondary references may be added.

2. The BKCASE Project will develop recommendations on how INCOSE and the IEEE will maintain and evolve SEBoK in accordance with the BKCASE charter, assuming those organizations become stewards of SEBoK after Version 1.0 is released. Version 1.0 of SEBoK itself will include features to facilitate its maintenance and evolution, including the ability for SEBoK users to readily propose new references and evaluate existing references, as well as readily propose changes to all other aspects of the SEBoK.

3. Primary direct SEBoK users will be (a) practicing systems engineers ranging from novices up through senior experts, (b) those responsible for defining and implementing SE processes within organizations, projects, and programs; (c) those responsible for certifying systems engineers and developing certification programs; (d) customers of SE organizations to help them better select and evaluate those organizations; (e) any project manager, engineer, technologist, researcher, or scientist who needs to know about SE; (f) those who educate and train systems engineers; and (g) the GRCSE author team. The SEBoK will facilitate easy access and use by these different types of users.

4. Secondary SEBoK users will be human resource professionals and other workforce development professionals, senior non-technical managers, and lawyers who will use the SEBoK with the support of systems engineers. The SEBoK will facilitate easy access and use by these users.

5. The ISO/IEC/IEEE 15288 process structure will be the initial architecture for the SEBoK. The authors will divide into several teams. Each team will be assigned non-overlapping subsets of 15288 processes. Each team will independently develop initial SEBoK content for their process subset, including methods, techniques, and primary references, taking into account primary and secondary SEBoK users. At Workshop 2, the results of the individual team efforts will be jointly evaluated by the entire author team leading to a revised architecture.

6. Version 0.25 of the SEBoK will be domain independent. Domain dependent knowledge will be captured through case studies of individual systems within specific domains. Those case studies will be companion documents to Version 0.25. After Version 0.25 is complete, the decision to use case studies as the only means to capture domain specific knowledge will be revisited.

Appendix E: Success Criteria

An initial set of success criteria were agreed on. These will be revisited at each workshop.

The BKCASE project will be considered successful by contributing authors, if within one year after SEBoK Version 1.0 is complete:

- The authors are using it

- INCOSE/IEEE/DoD recognizes and publishes it on their websites

- It becomes a living document (others are adding case studies, commenting on it, downloading it, etc)

- SEBoK has started informing the INCOSE certification process

- Both INCOSE and the IEEE are sponsors, having assumed maintenance responsibility for SEBoK

- The U.S. Defense Acquisition University has starting updating their courses to rely on SEBoK

- The U.S. DoD SE Competency framework updated to rely on SEBoK

- Many corporations that recognize SE post SEBoK as a reference asset for employee usage taking advantage of active links to connect references and influence their internal training programs

- Some corporations that do not yet recognize SE begin to use the SEBoK to help generate visibility and interest in SE

- The BKCASE sponsors provide clear recognition on how well project did

- SEBoK is cited in publications by others

- Journal papers written by authors on SEBoK are accepted for publication

- The INCOSE Handbook is updated to be consistent with SEBoK

- Educators use SEBoK when including SE in their programs

Appendix F: Action Items

The following are the Workshop 2 action items for the BKCASE authors and core team members:

Item	Individual (s) Responsible
Work on getting authors in the telecommunications, medical, civil engineering infrastructure (water management, environmental engineers), and civil aviation areas	John Baras
Contact individuals in highways and dams (public works) in the Netherlands; and Erik Aslaksen, with domain experience in construction from Australia; Mike Krueger on transportation system from California DOT	Kevin Forsberg
Invite Guilherme Travassos, who supports a combined SE/SW program from Brazil and may represent the Brazilian Computer Society and Bobby Milstein from the U.S. Centers for Disease Control and Prevention (CDC)	Nicole Hutchison
Contact Tom Strandberg from mobile communications Sweden	Rick Adcock
Reach out to Yoshi to get recommendations for authors from the commercial sector in Japan; he will also reach out to the manufacturing sector in Taiwan and China	Tim Ferris
Reach out for automobile and ship-building authors from South Korea	John Snoderly
Reach out to Johann Anselma in South Africa (non-defense domain)	Garry Roedler
Reach out to IBM Global Systems on non-defense, large-scale systems	Art Pyster
Reach out to someone in c=Cloud Computing (possibly Amazon)	Mary VanLeer
Consider additional possible authors and contact Dr. Pyster and Dr. Olwell with further recommendations	All Authors
Jean Claude Roussel volunteered post workshop via email to contact colleagues in France and Germany as EADS colleagues or respecitvie members of AFIS (French INCOSE Chapter) and GfSE (German INCOSE chapter. Jean Claude is meeting with the AFIS team to introduce BKCASE. Alain Faisandier, AFIS Technical Director (also an ISO 15288 author well known in INCOSE community) is another recommended selection, by Jean Claude, for author.	Jean Claude Roussel
Reach out to potential commercial authors in Singapore	Alex Lee
Draft Introductory materials for the SEBOK (first draft due March 9, 2010)	Gold Team
Draft materials on Acquisition, Supply, Configuration Management, and Information Management processes (2-3 pages per process, using template, first draft due March 9, 2010)	Blue Team
Draft materials on Life Cycle Model Management, Infrastructure Management, Project Portfolio Management, Human Resource Management, and Quality Management processes(2-3 pages per process, using template, first draft due March 9, 2010)	Red Team
Draft materials on Project Planning, Project Assessment and Control, Decision Management, Risk Management, and Measurement processes(2-3 pages per process, using template, first draft due March 9, 2010)	Green Team
Draft materials on Stakeholder Requirements Definition, Requirements Analysis, Architectural Analysis, Architectural Design, and Implementation	Yellow Team

Note: Rows are grouped by "Additional Author Team Members" and "Draft version 0.25" (side labels).

	processes(2-3 pages per process, using template, first draft due March 9, 2010)	
	Draft materials on Integration, Verification, Transition, Validation, Operation, Maintenance, and Disposal processes(2-3 pages per process, using template, first draft due March 9, 2010)	Purple Team
	Draft materials on N/A (Gold team is responsible for drafting the introductory materials for version 0.25) (2-3 pages per process, using template, first draft due March 9, 2010)	
	Review all materials and provide comments by March 18, 2010	All Authors
	Review, Adjudicate, and Develop Briefing materials on Comments	Team Leads
Workshops	Arrangements for Mini-meeting at INCOSE IW	Art Pyster
	Arrange for Workshop 2	Tom Hilburn, Stephanie Few, Nicole Hutchison
	Arrange for EUSEC	Rick Adcock
	Determine date and time for meeting at INCOSE IS	Art Pyster
Other	Edit Sakai's structure and add authors as participants to the Sakai collaboration site.	Stephanie Few